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Chapter 15: DTM

Overview

There will be occasions when a tin will need to be created from a 3D drawing. This can be done using the Extract Graphics command. The following paragraphs and workflows will describe the steps in creating and checking a tin.

Extracting Graphics

This is a two-step process. The first step is to create a **.dat** file then the second step will use the **.dat** file to create the **.tin**. *Workflow 1* will describe these two processes.

Workflow 1: Extracting Graphics

1. *Open the .dtm file that contains the 3 dimensional elements that will be used to create the tin.*

2. *Access the DTM Menu by clicking on Applications>Geopak Road>DTM tools as shown below,*
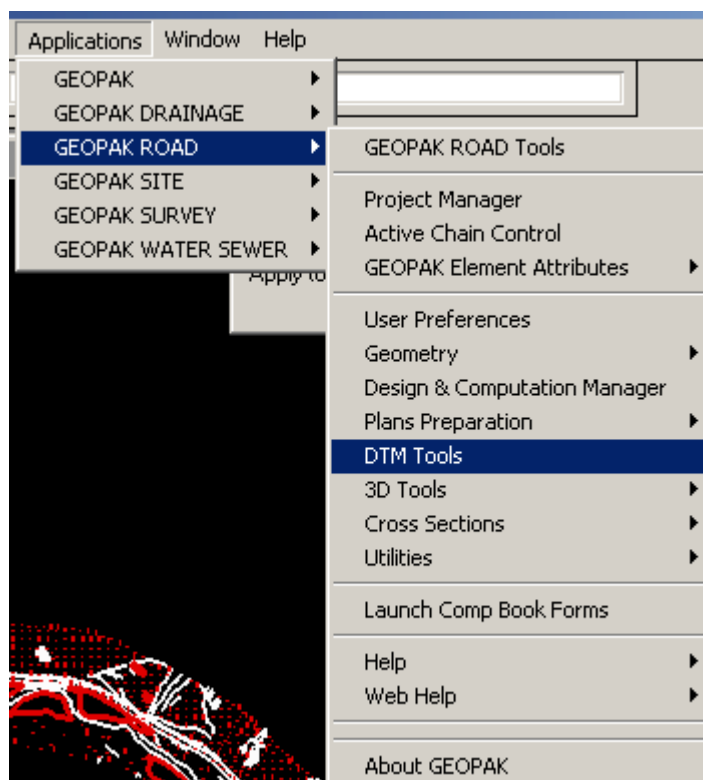

Figure 15-1: Accessing DTM Tools

or by clicking on the DTM icon in the GEOPAK toolbar.

Figure 15-2: DTM Tools Icon

3.   *This will bring up the following dialog box.*

Figure 15-3: DTM Tools Dialog

Click on the Extract Graphics button.

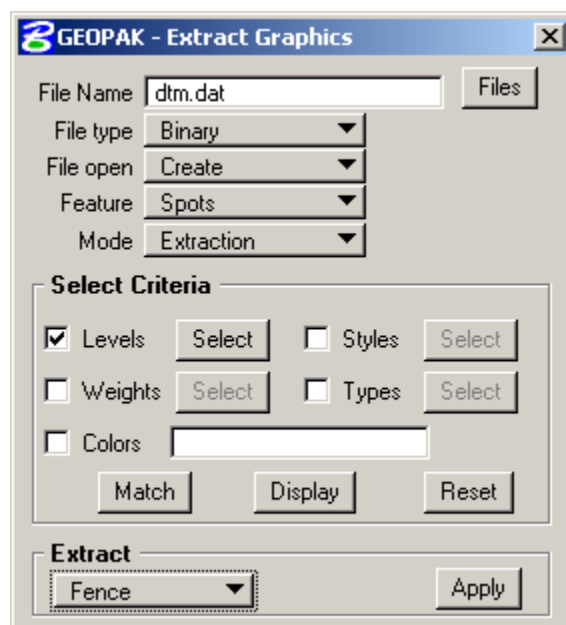4.   *The following dialog box will come up.*

Figure 15-4: Extract Graphics

Fill in the file name for the .dat file, make sure the File open button is on Create unless adding information to an existing .dat file.

5. *CFLHD leveling convention allows for easy separation by level only so the Levels box should be the only one marked in the Select Criteria area. Pick the Select box by the Levels label to bring up a MicroStation Level dialog box. Since Spots is the Feature identified above the Select Criteria area, make sure all spots are on level 23 and then mark level 23 only then select OK.*

6. *Put an inside fence around the elements to be extracted, make sure Fence is picked in the Extract portion of the Extract Graphics dialog box and pick Apply.*

7. *Once that data is extracted change the Extract Graphics dialog box to show File Open = Append and Feature = Breaks as shown below.*
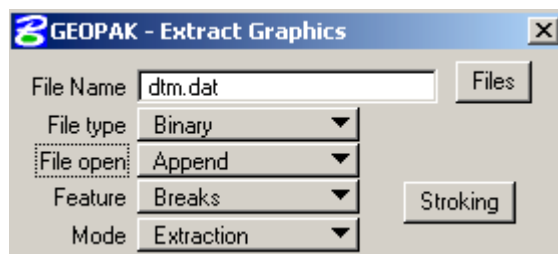
Figure 15-5: Append Settings

8. *Make sure all the breaklines are on level 24 and then change the Selection Level to level 24 and press Apply.*

9. *Once the .dat file is completed, pick the Build Triangles button.*
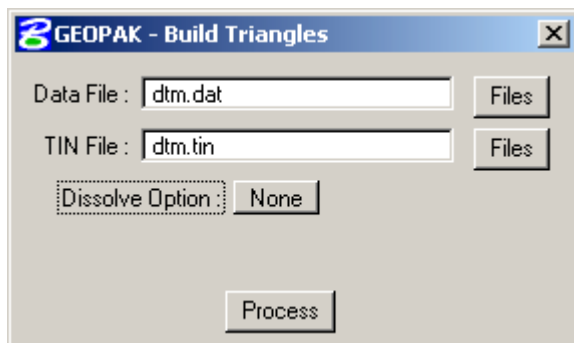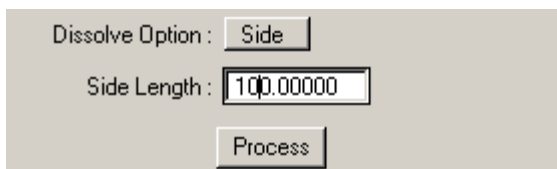
This will bring up the following dialog box.

Figure 15-6: Build Triangles

10. *GEOPAK will automatically input the .dat file just created. Type in the .tin filename and change the Dissolve Option from None to Side. The bottom of the dialog will change to look like this.*

Figure 15-7: Dissolve Option

11. *The side length refers to the length of a triangle leg. Make sure this length is long enough to avoid any gaps in the middle of the tin, but short enough to keep the triangles from spanning areas where there is no survey.*

12. *Pick process and GEOPAK will build the tin.*

Checking TIN

Once the tin is created, it is important to make sure no elements with zero elevations or no busts in the survey have been included in it. First, check the triangle statistics to verify that the elevation range is realistic. Then draw the contours to make sure they look reasonable. The following workflow will guide the user through these steps.
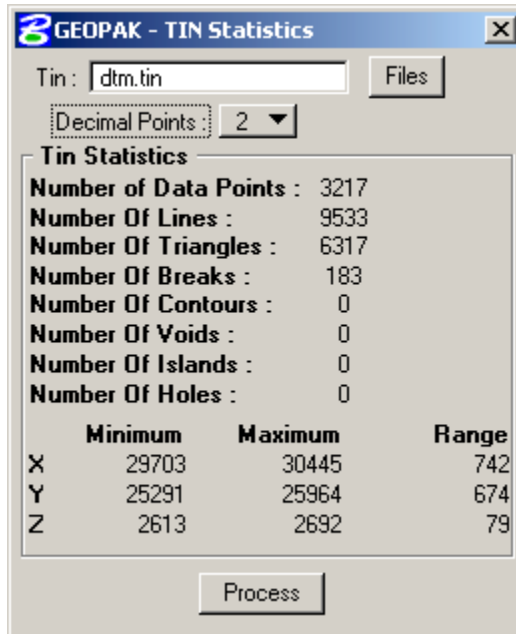
Workflow 2: Checking the .tin

1. *Click on the DTM Menu button* *to bring up the following dialog box.*
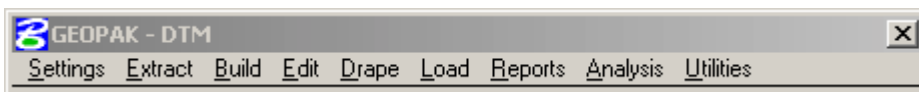
Figure 15-8: DTM Toolbar

2. *Select Reports>Triangle Statistics. The following dialog box will come up.*

Figure 15-9: Triangle Statistics

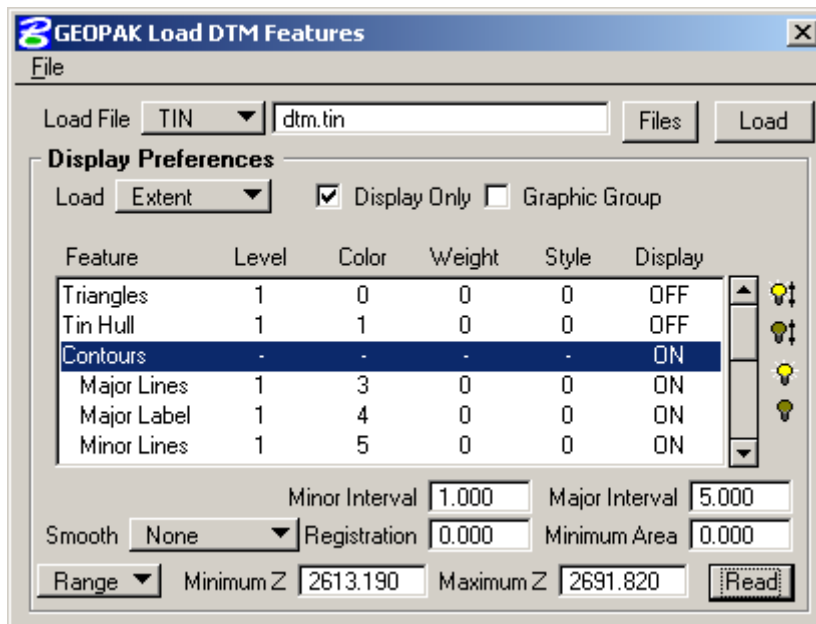3. *GEOPAK will automatically input the current .tin name. Press Process and GEOAPK will fill in the fields. Check the Z values to make sure they are consistent with the survey. If there is a zero value or the range does not seem correct, the best way to determine the location of the bust is to draw the contours as described below. Once the bust is located, the correction to the .dtm file can be made and the .dat file can be recreated.*

4. *To check the .tin by drawing the contours, pick the Load DTM Features button. The following dialog box will come up.*

Figure 15-10: Load DTM Features

5. *GEOPAK will fill in the current .tin file. Choose Extent and either Display Only or Graphic Group.*

If Display Only is selected, the contours will disappear when the view is refreshed. Selecting Graphic Group will allow the user to easily delete the contours.

6. *Set the Display for Contours, Major Lines, Major Label, and Minor lines on by highlighting each and picking the yellow light bulb without the arrows next to it. Set the Parameters for the lines and labels. Set the Major and Minor Intervals as above pick the Read button to set the range equal to the range of the tin and pick Load at the top of the dialog box.*

7. *Review the contours to determine where a bust may be. Make any corrections necessary and start the process over with workflow 1.*

These contours are not meant for plan production. This process is strictly for checking the tin.